Global climate model primer

What is a global climate model?

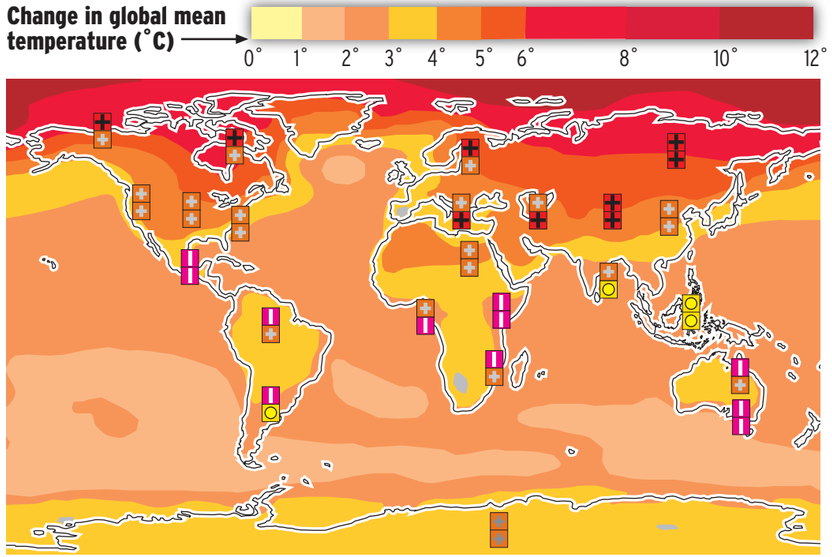
Each model is a complex series of mathematical equations designed to reproduce the physical forces of how land, atmosphere, oceans and other factors interact with one another. Many models can take months to run on some of the world's most powerful computers. Most models try to show what may happen with temperature and precipitation through 2100.

What can these models say about my hometown in 2100?

The current generation of global climate models do a great job with big picture patterns, but fall short on regions, states and cities. These computer programs break the world into chunks, some of which can cover an entire country. These grid pieces essentially treat everything as being part of the same climate. A model that treats the Western United States as one region fails to take into account the weather differences between Seattle and Salt Lake City.

Why do we need so many models?

Some researchers feel that each model has its strengths and weaknesses. If groups can average the data produced by many models, the results may be stronger than those from any individual study.



Source: University of Utah Intergovernmental Panel on Climate Change

What are the differences between these models?

All the models are built on the assumption that CO2 levels will double by the year 2100 and they all use the same numbers to estimate the incoming energy from the sun over the coming decades. Each report handles certain factors differently, such as the emission of ozone gases, how aerosols interact with the atmosphere and the formation of clouds.

Who is creating these global climate models?

Several nations have competing models. The Intergovernmental Panel on Climate Change, which has produced three international reports, is now looking at about 20 climate models for a future report. The U.S. Department of Commerce and NASA have several models between them.

How accurate are these models?

Each successive generation of climate models is considered to be more accurate. But these models cannot say what the temperature will be in Provo on Sept. 26, 2100. The models deal with average temperatures and precipitation levels over large areas. No model is guaranteed to be a 100 percent accurate picture of the future, but they give policy planners and other interested parties ideas about possible coming trends.

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